

DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

Interim Final 2/5/99

RCRA Corrective Action

Environmental Indicator (EI) RCRIS code (CA725)

Current Human Exposures Under Control

Facility Name: **Penn Engineering**
Facility Address: **5190 Old Easton Road, Danboro, PA 18916**
Facility EPA ID #: **PAD002371987**

1. Has **all** available relevant/significant information on known and reasonably suspected releases to soil, groundwater, surface water/sediments, and air, subject to RCRA Corrective Action (e.g., from Solid Waste Management Units (SWMU), Regulated Units (RU), and Areas of Concern (AOC)), been **considered** in this EI determination?

If yes – check here and continue with #2 below.

If no – re-evaluate existing data, or

If data are not available skip to #6 and enter “IN” (more information needed) status code.

BACKGROUND

Definition of Environmental Indicators (for the RCRA Corrective Action)

Environmental Indicators (EI) are measures being used by the RCRA Corrective Action program to go beyond programmatic activity measures (e.g., reports received and approved, etc.) to track changes in the quality of the environment. The two EI developed to-date indicate the quality of the environment in relation to current human exposures to contamination and the migration of contaminated groundwater. An EI for non-human (ecological) receptors is intended to be developed in the future.

Definition of “Current Human Exposures Under Control” EI

A positive “Current Human Exposures Under Control” EI determination (“YE” status code) indicates that there are no “unacceptable” human exposures to “contamination” (i.e., contaminants in concentrations in excess of appropriate risk-based levels) that can be reasonably expected under current land- and groundwater-use conditions (for all “contamination” subject to RCRA corrective action at or from the identified facility [i.e., site-wide]).

Relationship of EI to Final Remedies

While Final remedies remain the long-term objective of the RCRA Corrective Action program the EI are near-term objectives which are currently being used as Program measures for the Government Performance and Results Act of 1993, GPRA). The “Current Human Exposures Under Control” EI are for reasonably expected human exposures under current land- and groundwater-use conditions ONLY, and do not consider potential future land- or groundwater-use conditions or ecological receptors. The RCRA Corrective Action program’s overall mission to protect human health and the environment requires that Final remedies address these issues (i.e., potential future human exposure scenarios, future land and groundwater uses, and ecological receptors).

Duration / Applicability of EI Determinations

EI Determinations status codes should remain in RCRIS national database ONLY as long as they remain true (i.e., RCRIS status codes must be changed when the regulatory authorities become aware of contrary information).

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2. Are groundwater, soil, surface water, sediments, or air **media** known or reasonably suspected to be **“contaminated”**¹ above appropriately protective risk-based “levels” (applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action (from SWMUs, RUs or AOCs)?

	<u>Yes</u>	<u>No</u>	<u>?</u>	<u>Rationale/Key Contaminants</u>
Groundwater	X			Chlorinated VOCs, 1,4-dioxane
Air (indoors) ²		X		VOCs present in groundwater and soil. Vapor intrusion pathway into existing buildings and nearby residential structures likely insignificant.
Surface Soil (e.g., <2 ft)		X		VOCs detected in soils samples are below current PADEP non-residential MSCs.
Surface Water		X		The facility does not have any industrial discharges. Release into surface water was remediated. Groundwater discharge to creek likely insignificant.
Sediment		X		The facility does not have any industrial discharges. Release into surface water was remediated. Groundwater discharge to creek likely insignificant.
Subsurf. Soil (e.g., >2 ft)	X			1,1,1-TCA was stored in UST 005. All contaminated soil was not excavated due to presence of underground utilities and groundwater, and excavation was backfilled with PADEP’s approval.
Air (outdoors)		X		There have been no reported air emissions releases from the facility. Facility appears to be exempt from air permitting requirements.

_____ If no (for all media) - skip to #6, and enter “YE,” status code after providing or citing appropriate “levels,” and referencing sufficient supporting documentation demonstrating that these “levels” are not exceeded.

X If yes (for any media) - continue after identifying key contaminants in each “contaminated” medium, citing appropriate “levels” (or provide an explanation for the determination that the medium could pose an unacceptable risk), and referencing supporting documentation.

_____ If unknown (for any media) - skip to #6 and enter “IN” status code.

¹ “Contamination” and “contaminated” describes media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriately protective risk-based “levels” (for the media, that identify risks within the acceptable risk range).

² Recent evidence (from the Colorado Dept. of Public Health and Environment, and others) suggest that unacceptable indoor air concentrations are more common in structures above groundwater with volatile contaminants than previously believed. This is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration necessary to be reasonably certain that indoor air (in structures located above (and adjacent to) groundwater with volatile contaminants) does not present unacceptable risks.

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Rationale and Reference(s):

Groundwater: Based on a November 2013 sampling of inactive production wells at the facility (below), groundwater beneath the facility is contaminated based on exceedances of Pennsylvania’s residential used aquifer Medium Specific Concentrations (MSCs).

Parameter	MSC*	OW17A @135'	OW17A @560'	NPDW @100'	NPDW @200'	NPDW @300'	MSW @100'	MSW @200'	MSW @300'
1,1,1-TCA	200	21.6	21.8	238	134	35.2	4.4	6.2	5.3
1,1-DCA	31	28.6	18.8	181	116	43.5	0.54	0.74	0.75
1,1-DCE	7	12.9	8.6	47.8	25.8	8.2	<1	1.1	1
TCE	5	0.33	0.75	6.4	3.1	1.3	6.8	15.7	13.2
VC	2	2.6	3.8	<1	<1	<1	<1	<1	<1

All results in ug/L; **bold** results exceed the MSC

* MSCs listed are identical to EPA’s Maximum Contaminant Levels (MCLs) except for 1,1-DCA, for which no MCL exists.

Air: The facility appears to be exempt from air permitting requirements. Based on soil and groundwater contamination information collected to date, the vapor intrusion pathway into the existing facility buildings, as well as nearby residential structures (primarily the mobile home park south of the facility), is not expected to be complete as maximum contaminant concentrations in shallow groundwater do not exceed vapor intrusion screening levels.

Soil: Surface and subsurface soil sampling conducted in 2013 and 2014 at suspected source areas suggests that soils are not contaminated above appropriately protective risk-based levels; however, all visibly-contaminated subsurface soil could not be removed from the area of former USTs 003 through 005 due to the presence of underground utilities. Therefore, some localized subsurface soil contamination remains at the facility.

Surface water/sediment: The facility does not have any industrial discharges and, thus, does not operate under a NPDES permit or a township pre-treatment permit. Other than a 1992 release due to broken underground piping of primarily mineral spirits to the North Branch of Neshaminy Creek via the facility’s stormwater management system (which was able to collect and treat a portion of the release prior to discharge to the creek), there have been no other noted releases to surface water bodies.

It is assumed that shallow groundwater flow beneath the facility is toward the North Branch of Neshaminy Creek and the unnamed tributary (to the northwest and southwest), and deeper flow is assumed to be toward the south-southeast along bedding planes and joint sets (low concentrations of 1,1,1-TCA and 1,1-DCE are consistently detected in the mobile home park wells south and southeast of the facility). However, considering that the majority of groundwater contamination is deeper within the bedrock aquifer and that maximum detected contaminant concentrations in groundwater, even if directly discharged to the creek, would not likely result in exceedances of Pennsylvania’s Ambient Water Quality Criteria, surface water and sediment are not reasonably suspected to be contaminated above appropriately protective risk-based levels.

References: Environmental Indicator Inspection Report for PennEngineering, prepared by Baker, December 2011.
Investigation Work Plan Technical Memorandum #2 for PennEngineering, prepared by WSP, February 2015.

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3. Are there **complete pathways** between “contamination” and human receptors such that exposures can be reasonably expected under the current (land- and groundwater-use) conditions?

Summary Exposure Pathway Evaluation Table

Contaminated Media	Potential Human Receptors (Under Current Conditions)						
	<u>Residents</u>	<u>Workers</u>	<u>Day-Care</u>	<u>Construction</u>	<u>Trespassers</u>	<u>Recreation</u>	<u>Food³</u>
Groundwater Air (indoors)	Yes	Yes	No	Yes	No	No	No
Soil (surface, e.g., <2 ft. Surface Water Sediment							
Soil (subsurface e.g., >2 ft. Air (outdoors)	No	No	No	Yes	No	No	No

Instructions for Summary Exposure Pathway Evaluation Table:

1. Strike-out specific Media including Human Receptors’ spaces for Media which are not “contaminated” as identified in #2 above.
2. enter “yes” or “no” for potential “completeness” under each “Contaminated” Media -- Human Receptor combination (Pathway).

Note: In order to focus the evaluation to the most probable combinations some potential “Contaminated” Media - Human Receptor combinations (Pathways) do not have check spaces (“___”). While these combinations may not be probable in most situations they may be possible in some settings and should be added as necessary.

_____ If no (pathways are not complete for any contaminated media-receptor combination) - skip to #6, and enter “YE” status code, after explaining and/or referencing condition(s) in-place, whether natural or man-made, preventing a complete exposure pathway from each contaminated medium (e.g., use optional Pathway Evaluation Work Sheet to analyze major pathways).

X_____ If yes (pathways are complete for any “Contaminated” Media - Human Receptor combination) - continue after providing supporting explanation.

_____ If unknown (for any “Contaminated” Media - Human Receptor combination) - skip to #6 and enter “IN” status code.

Rationale and Reference(s):

Groundwater: Since groundwater is used as a potable water source in the vicinity of the facility, residents and workers may be exposed to contamination via ingestion of contaminated groundwater. Construction workers may also be exposed to contamination via incidental ingestion of, or direct contact with, groundwater during intrusive operations. There are no known day-care facilities in the vicinity of the facility, and exposure to contaminated groundwater is not reasonably expected for trespassers, recreational receptors, and food sources.

Subsurface soil: Construction workers may be exposed to contaminated subsurface soil during intrusive operations at the facility. No other receptors are reasonably expected to be exposed to contaminated subsurface soil.

³ Indirect Pathway/Receptor (e.g., vegetables, fruits, crops, meat and dairy products, fish, shellfish, etc.

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4. Can the **exposures** from any of the complete pathways identified in #3 be reasonably expected to be **“significant”**⁴ (i.e., potentially “unacceptable” because exposures can be reasonably expected to be: 1) greater in magnitude (intensity, frequency and/or duration) than assumed in the derivation of the acceptable “levels” (used to identify the “contamination”); or 2) the combination of exposure magnitude (perhaps even though low) and contaminant concentrations (which may be substantially above the acceptable “levels”) could result in greater than acceptable risks)?

 X If no (exposures can not be reasonably expected to be significant (i.e., potentially “unacceptable”) for any complete exposure pathway) - skip to #6 and enter “YE” status code after explaining and/or referencing documentation justifying why the exposures (from each of the complete pathways) to “contamination” (identified in #3) are not expected to be “significant.”

_____ If yes (exposures could be reasonably expected to be “significant” (i.e., potentially “unacceptable”) for any complete exposure pathway) - continue after providing a description (of each potentially “unacceptable” exposure pathway) and explaining and/or referencing documentation justifying why the exposures (from each of the remaining complete pathways) to “contamination” (identified in #3) are not expected to be “significant.”

_____ If unknown (for any complete pathway) - skip to #6 and enter “IN” status code

Rationale and Reference(s):

According to the PADEP Drinking Water System database, the mobile home park immediately downgradient of the facility routinely monitors its public supply wells for multiple parameters for compliance with the Safe Drinking Water Act (SDWA). This includes annual monitoring for regulated VOCs. A brief review of the analytical data for samples collected from the water system’s entry point (tap at the pump house) shows that 1,1,1-TCA and 1,1-DCE have been consistently detected since 2000. Both of these VOCs were also detected in 1993. Concentrations ranged from 1.7 ug/L to 23.7 ug/L for 1,1,1-TCA and 0.86 ug/L to 3 ug/L for 1,1-DCE, below the current PADEP residential MSCs. The mobile home park wells are 87 to 750 feet deep. (Note: The use of 1,1-DCE at this facility was not documented in the regulatory files; however, the environmental occurrence of 1,1-DCE is generally related to its disposal as a waste material or to the anaerobic biodegradation of tetrachloroethylene [PCE] and trichloroethylene [TCE] and the hydrolysis of 1,1,1-TCA.)

Analysis in July 2013 of a more recently installed well nearest the facility that was to be included in the mobile home park’s water system showed more significant contamination and, as a result, has not been connected to the water system or otherwise used for potable purposes.

The facility has a groundwater withdrawal permit to continue withdrawal of up to 1.3 million gallons/month from existing semi-artesian Well G to supply the manufacturing facility. Well G is monitored regularly for compliance with the SDWA. The facility provided the analytical results for VOCs analyzed in groundwater samples collected from Well G on May 10, 2010 and April 20, 2011. None of the VOCs analyzed for were detected above method detection limits, except toluene, which was detected at a concentration of 0.0009 mg/L, below the PADEP residential MSC and the MCL of 1 mg/L in the April 20, 2011 sample.

It is expected that construction workers engaging in intrusive activities would wear appropriate protective equipment and follow safe work practices to minimize exposure to impacted groundwater and subsurface soil.

⁴ If there is any question on whether the identified exposures are “significant” (i.e., potentially “unacceptable”) consult a human health Risk Assessment specialist with appropriate education, training and experience.

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5. Can the “significant” **exposures** (identified in #4) be shown to be within **acceptable** limits?

_____ If yes (all “significant” exposures have been shown to be within acceptable limits) - continue and enter “YE” after summarizing and referencing documentation justifying why all “significant” exposures to “contamination” are within acceptable limits (e.g., a site-specific Human Health Risk Assessment).

_____ If no (there are current exposures that can be reasonably expected to be “unacceptable”) - continue and enter “NO” status code after providing a description of each potentially “unacceptable” exposure.

_____ If unknown (for any potentially “unacceptable” exposure) - continue and enter “IN” status code

Rationale and Reference(s):

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6. Check the appropriate RCRIS status codes for the Current Human Exposures Under Control EI event code (CA725), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (and attach appropriate supporting documentation as well as a map of the facility):

 X YE – Yes, “Current Human Exposures Under Control” has been verified. Based on a review of the Information contained in this EI Determination, “Current Human Exposures” are expected to be “Under Control” at the Penn Engineering and Manufacturing Corporation facility, EPA ID # PAD002371987 , located at 5190 Old Easton Road, Danboro, PA 18916 under current and reasonably expected conditions. This determination will be re-evaluated when the Agency/State becomes aware of significant changes at the facility.

 NO - “Current Human Exposures” are NOT “Under Control.”

 IN - More information is needed to make a determination.

Completed by (signature) /Griff E. Miller/ Date 9/10/15
(print) Griff Miller
(title) Remedial Project Manager

Supervisor (signature) /Paul Gotthold/ Date 9/11/15
(print) Paul Gotthold
(title) Associate Director
(EPA Region or State) EPA Region 3

Locations where References may be found:

USEPA Region III
Waste and Chemical Mgmt. Division
1650 Arch Street
Philadelphia, PA 19103

PADEP
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2 E Main Street
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FINAL NOTE: THE HUMAN EXPOSURES EI IS A QUALITATIVE SCREENING OF EXPOSURES AND THE DETERMINATIONS WITHIN THIS DOCUMENT SHOULD NOT BE USED AS THE SOLE BASIS FOR RESTRICTING THE SCOPE OF MORE DETAILED (E.G., SITE-SPECIFIC) ASSESSMENTS OF RISK.